REMARKS

I. Introduction

Claims 1 and 3 to 14 are currently pending in this application. In view of the foregoing amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

II. Interview Summary

Applicant thanks the Examiner for the courtesies extended during the telephone interview of April 29, 2005.

The following is a Statement of Substance of Interview of the telephone interview of April 29, 2005.

During the course of the telephone interview no exhibit was shown and no demonstration was conducted.

During the course of the telephone interview claim 1, 13 and 14 were discussed.

During the course of the telephone interview U.S. Patent No. 4,718,999 ("Suzuki et al."), U.S. Patent No. 4,505,807 ("Yamada") and U.S. Patent No. 4,769,123 ("Mase et al.") were discussed.

During the course of the telephone interview Applicant argued that none of the references cited would render unpatentable claims 1, 13 and 14, as amended herein. Specifically, Applicant argued that the language the "layer plane is at least approximately vertically centered with respect to the sensor element, the measuring cell layer, covering layer and layer plane extending in a horizontal direction" addresses the Final Office Action's concerns expressed in paragraph 26 of the Final Office Action. Applicant further argued that the language "the covering layer adjoins the heating element on a side of the heating element facing away from the measuring cell layer" addresses the Final Office Action's concerns expressed in paragraphs 4 and 24 of the Final Office Action.

During the course of the telephone interview, the Examiner agreed with all of Applicants arguments and stated that claims 1, 13 and 14, as amended, would be allowable.

The general results or outcome of the telephone interview is that an agreement was reached.

III. **Rejection of Claims 1, 3 to 9 and 11 to 14 Under 35 U.S.C. § 102(b)**

Claims 1, 3 to 9 and 11 to 14 were rejected under 35 U.S.C. § 102(b) as anticipated by Suzuki et al. Applicants respectfully submit that Suzuki et al. do not anticipate the present claims for the following reasons.

Claim 1 relates to a planar sensor element for determining at least one gas component and recites that the planar sensor element includes a layer structure. Claim 1 further recites that the layer structure includes a measuring cell layer, a covering layer, a heating element generating a heating power and a layer-shaped heating conductor embedded in the heating element in a layer plane of the layer structure. Claim 1 has been amended to recite that the layer plane is at least approximately vertically centered with respect to the sensor element, the measuring cell layer, covering layer and layer plane extending in a horizontal direction. Claim 1 has further been amended to recite that the covering layer adjoins the heating element on a side of the heating element facing away from the measuring cell layer, wherein the covering layer extends from the side of the heating element facing away from the measuring cell layer to an end face of the planar sensor element. Support for these amendments can be found, for example, in Figure 1. Claim 1 further recites that the covering layer does not form part of an oxygen pump cell or an oxygen concentration cell.

Claim 13 relates to a planar sensor element for determining at least one gas component. Claim 13 recites that the planar sensor element includes a layer structure. Claim 13 further recites that the layer structure includes at least one of an oxygen pump layer and an oxygen concentration layer, a covering layer, a heating element generating a heating power and a layer-shaped heating conductor being embedded in the heating element in a layer plane of the layer structure. Claim 13 further recites that the covering layer does not form a part of another oxygen pump cell or another oxygen concentration cell. Claim 13 has been amended to recite that the layer plane is at least approximately vertically centered with respect to the sensor element, the (i) at least one of an oxygen pump layer and an oxygen concentration layer, (ii) covering layer and (iii) layer plane extending in the horizontal direction. Claim 13 has further been amended to recite that the covering layer adjoins the heating element on a side of the heating element facing away from the measuring cell layer, wherein the covering layer extends from the side of the heating element facing away from the measuring cell layer to an end face of the planar sensor element. Support for these amendments can be found, for example, in Figure 1.

Claim 14 relates to a planar sensor element for determining at least one gas component. Claim 14 recites that the planar sensor element includes a layer structure.

Claim 14 further recites that the layer structure includes a measuring cell layer having at least one surface, a covering layer, a heating element generating a heating power, a layer-shaped heating conductor being embedded in the heating element in a layer plane of the layer structure and at least one electrode, each electrode arranged on a respective surface of the measuring cell layer. Claim 14 further recites that the layer-shaped heating conductor is arranged in a layer plane of the layer structure to obtain an at least approximately homogeneous distribution of the heating power over a cross-section of the sensor element perpendicular to the layer structure. Claim 14 further recites that the covering layer does not form part of an oxygen pump cell or an oxygen concentration cell. Claim 14 has been amended to recite that the layer plane is at least approximately vertically centered with respect to the sensor element, the measuring cell layer, covering layer and layer plane extending in the horizontal direction. Claim 14 has further been amended to recite that the covering layer adjoins the heating element on a side of the heating element facing away from the measuring cell layer, wherein the covering layer extends from the side of the heating element facing away from the measuring cell layer to an end face of the planar sensor element. Support for these amendments can be found, for example, in Figure 1.

Suzuki et al. purportedly relate to an air-fuel ratio detector. Suzuki et al. state that the detector performs a stoichiometric function. See col. 3, lines 38 to 39. Suzuki et al. further state that a part of the oxygen gas flowing into the diffusion chamber 128 at the diffusion rate-determining speed through the diffusion path 130, is reduced to oxygen ions (O--) at the cathode 123, which then moves towards the oxygen reference electrode 126 inside the zirconia solid electrolyte 120, is oxidized to oxygen gas at this reference oxygen electrode 1126 and is thereafter emitted into the diffusion chamber 129. See col. 3, lines 44 to 52. As can be seen in Figure 2, the above described gas path is shown as an arrow beginning at electrode 123 and ending at electrode 126.

The Final Office Action alleges that lowermost portion of electrolyte 120 in Figure 11 of Suzuki et al. qualifies as the covering layer, as recited in claims 1, 13 and 14. However, as the Examiner agreed with during the interview of April 29, 2005, the lowermost portion of electrolyte 120 does not adjoin the heating element and extend from the side of the heating element facing away from the measuring cell layer to an end face of the planar sensor element, as required by amended claims 1, 13 and 14. More specifically, Suzuki et al. do not disclose, or even suggest, a covering layer which adjoins the heating element on a side of the heating element facing away from the measuring cell layer and does not form a part of another oxygen pump cell or another oxygen concentration cell, wherein the covering layer

extends from the side of the heating element facing away from the measuring cell layer to an end face of the planar sensor element, as required by claims 1, 13 and 14. Therefore, Suzuki et al. do not disclose, or even suggest, all of the limitations of amended claims 1, 13 and 14.

To anticipate a claim, each and every element as set forth in the claim must be found in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). That is, the prior art must describe the elements arranged as required by the claims. In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). As indicated above, it is respectfully submitted that Suzuki et al. do not disclose, or even suggest, all of the limitations of claims 1, 13 and 14. It is therefore respectfully submitted that Suzuki et al. do not anticipate claims 1, 13 and 14.

With regard to claims 3 to 9, 11 and 12, which ultimately depend from claim 1 and therefore include all of the limitations of claim 1, it is respectfully submitted that Suzuki et al. do not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claim 1.

With further regard to claim 8, Applicants respectfully submit that Suzuki et al do not disclose, or even suggest, a layer-shaped heating conductor arranged in the layer plane of the layer structure to obtain an at least approximately homogeneous distribution of the heating power over a cross-section of the sensor element perpendicular to the layer structure. The Final Office Action alleges that Suzuki would inherently possess the claimed homogenous heat distribution, however, Applicants respectfully submit that the anode portion 124 on the top layer of the Suzuki et al. detector, which is not present on the bottom layer, skews the distribution of heat. Therefore, Applicants respectfully submit that Suzuki et al. do not render unpatentable claim 8 for this additional reason.

With further regard to claim 11, Applicants respectfully submit that Suzuki et al. do not disclose, or even suggest, that a measuring cell layer contacts a first planar surface of a heating element and a covering layer contacts a second opposing planar surface of the heating element. As indicated above, the heating element of Suzuki et al. does not lie directly between the measuring cell layer and the alleged "covering layer." Therefore, Applicants submit that Suzuki et al. do not anticipate claim 11 for this additional reason.

For all of the foregoing reasons, withdrawal of this rejection is respectfully requested.

IV. Rejection of Claims 1, 3 to 9 and 11 to 14 Under 35 U.S.C. § 103(a)

Claims 1, 3 to 9 and 11 to 14 were rejected under 35 U.S.C. § 103(a) as unpatentable over Suzuki et al. Applicants respectfully submit that Suzuki et al. do not render unpatentable the present claims for the following reasons.

As indicated above, Suzuki et al. do not disclose, or even suggest, all of the limitations of claims 1, 13 and 14, as amended. More specifically, Suzuki et al. do not disclose, or even suggest, a covering layer which adjoins the heating element on a side of the heating element facing away from the measuring cell layer and does not form a part of another oxygen pump cell or another oxygen concentration cell, wherein the covering layer extends from the side of the heating element facing away from the measuring cell layer to an end face of the planar sensor element as required by claims 1, 13 and 14.

To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). As more fully set forth above, it is respectfully submitted that Suzuki et al. fail to disclose, or even suggest, all of the limitations of claims 1, 13 and 14. It is therefore respectfully submitted that Suzuki et al. do not render unpatentable claims 1, 13 and 14.

As for claims 3 to 9, 11 and 12 which ultimately depend from claim 1 and therefore include all of the limitations of claim 1, it is respectfully submitted that Suzuki et al. do not render obvious these dependent claims for at least the same reasons given above in support of the patentability of claim 1. In re Fine, supra (any dependent claim depending from a non-obvious independent claim is non-obvious).

With further regard to claim 8, as indicated above, Applicants respectfully submit that Suzuki et al. do not disclose, or even suggest, a layer-shaped heating conductor arranged in a layer plane of a layer structure to obtain an at least approximately homogeneous distribution of heating power over a cross-section of a sensor element perpendicular to the layer structure. Applicants respectfully submit that Suzuki et al. do not render unpatentable claim 8 for this additional reason.

V. Rejection of Claims 1, 3 to 9, 11, 13 and 14 under 35 U.S.C. § 102(b)

Claims 1, 3 to 9, 11, 13 and 14 were rejected under 35 U.S.C. § 102(b) as anticipated by Mase et al. Applicants respectfully submit that Mase et al. do not anticipate the present claims as amended for the following reasons.

Mase et al. purportedly relate to an electrochemical device. The Final Office Action alleges that because the various layers of the device are shown stacked on top and in-line with each other, all the various elements of the sensor would read on "at least approximately centered." The Final Office Action alleges that although this is not centered (namely centered with respect to the vertical layers), it reads on the claimed term.

Claims 1, 13 and 14, as amended, recite that the heating element is embedded in the heating element in a layer plane of the layer structure and that the layer plane is at least approximately vertically centered with respect to the sensor element. Claims 1 and 14 have further been amended to recite that the measuring cell layer, covering layer and layer player plane extend in horizontal direction. Claim 13 has been amended to recite that the (i) at least one of an oxygen pump layer and an oxygen concentration layer, (ii) covering layer and (iii) layer plane extend in the horizontal direction. Support for these amendments can be found, for example, in Figure 1. The Final Office Action admits that heating element of Mase et al. is not vertically centered in the sensor. Therefore, Applicants respectfully submit that Mase et al. does not anticipate claims 1, 13 and 14.

With regard to claims 3 to 9 and 11, which ultimately depend from claim 1 and therefore include all of the limitations of claim 1, it is respectfully submitted that Mase et al. do not anticipate these dependent claims for at least the same reasons given above in support of the patentability of claim 1.

With further regard to claim 8, Applicants respectfully submit that Mase et al. do not disclose, or even suggest, a layer-shaped heating conductor arranged in a layer plane of a layer structure to obtain an at least approximately homogeneous distribution of heating power over a cross-section of a sensor element perpendicular to the layer structure. As can be seen in Figure 1, the sensor of Mase et al. is not symmetrical on either side of layer 22. Applicants respectfully submit that Mase et al. do not render unpatentable claim 8 for this additional reason.

VI. Rejection of Claims 1, 3 to 9 and 11, 13 and 14 Under 35 U.S.C. § 103(a)

Claims 1, 3 to 9, 11, 13 and 14 were rejected under 35 U.S.C. § 103(a) as unpatentable over Mase et al. Applicants respectfully submit that Mase et al. do not render unpatentable the present claims for the following reasons.

As indicated above, Mase et al. do not disclose, or even suggest, all of the limitations of amended claims 1, 13 and 14. More specifically, Mase et al. do not disclose, or even suggest, a heating element embedded in the heating element in a layer plane of the layer structure and that the layer plane is at least approximately vertically centered with respect to the sensor element, wherein the measuring cell layer, covering layer and layer player plane extend in horizontal direction. It is therefore respectfully submitted that Mase et al. do not render unpatentable claims 1, 13 and 14.

As for claims 3 to 9 and 11, which ultimately depend from claim 1 and therefore include all of the limitations of claim 1, it is respectfully submitted that Mase et al. do not render obvious these dependent claims for at least the same reasons given above in support of the patentability of claim 1. In re Fine, supra (any dependent claim depending from a non-obvious independent claim is non-obvious).

With further regard to claim 8, Applicants respectfully submit that Mase et al. do not disclose, or even suggest, a layer-shaped heating conductor arranged in a layer plane of a layer structure to obtain an at least approximately homogeneous distribution of heating power over a cross-section of a sensor element perpendicular to the layer structure. As can be seen in Figure 1, the sensor of Mase et al. is not symmetrical on either side of layer 22. Applicants respectfully submit that Mase et al. do not render unpatentable claim 8 for this additional reason.

VII. Rejection of Claims 5 to 7 Under 35 U.S.C. § 103(a)

Claims 5 to 7 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Suzuki et al. or Mase et al. and U.S. Patent No. 5,879,525 ("Kato") Applicants respectfully submit that the combination of Suzuki et al. or Mase et al. and Kato does not render unpatentable the present claims for the following reasons.

As indicated above, neither Mase et al. nor Suzuki et al. disclose, or even suggest, all of the limitations of amended claim 1, from which claims 5 to 7 ultimately depend. More specifically, Suzuki et al. do not disclose, or even suggest, a covering layer which adjoins the heating element on a side of the heating element facing away from the measuring cell layer and does not form a part of another oxygen pump cell or another oxygen

concentration cell, wherein the covering layer extends from the side of the heating element facing away from the measuring cell layer to an end face of the planar sensor element, as required by claim 1. Further, Mase et al. do not disclose, or even suggest, a heating element embedded in the heating element in a layer plane of the layer structure and that the layer plane is at least approximately vertically centered with respect to the sensor element, wherein the measuring cell layer, covering layer and layer player plane extend in horizontal direction, as required by claim 1. Kato purportedly relates to an apparatus for measuring combustible gas component by burning component. Kato is not relied upon by the Final Office Action for remedying the above noted deficiencies of Suzuki et al. and Mase et al. It is therefore respectfully submitted that the combination of Suzuki et al. or Mase et al. and Kato does not render unpatentable claims 5 to 7. In re Fine, supra.

VIII. Rejection of Claim 10 Under 35 U.S.C. § 103(a)

Claim 10 was rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Suzuki et al. or Mase et al. and Yamada. Applicants respectfully submit that the combination of Suzuki et al. or Mase et al. and Yamada does not render unpatentable claim 10 for the following reasons.

As indicated above, neither Mase et al. nor Suzuki et al. disclose, or even suggest, all of the limitations of amended claim 1, from which claim 10 depends. More specifically, Suzuki et al. do not disclose, or even suggest, a covering layer which adjoins the heating element on a side of the heating element facing away from the measuring cell layer and does not form a part of another oxygen pump cell or another oxygen concentration cell, wherein the covering layer extends from the side of the heating element facing away from the measuring cell layer to an end face of the planar sensor element, as required by claim 1. Further, Mase et al. do not disclose, or even suggest, a heating element embedded in the heating element in a layer plane of the layer structure and that the layer plane is at least approximately vertically centered with respect to the sensor element, wherein the measuring cell layer, covering layer and layer player plane extend in horizontal direction, as required by claim 1. Yamada purportedly relates to an oxygen sensor. Yamada is not relied upon by the Final Office Action for remedying the above noted deficiencies of Suzuki et al. and Mase et al. It is therefore respectfully submitted that the combination of Suzuki et al. or Mase et al. and Yamada does not render unpatentable claim 10. In re Fine, supra.

IX. Conclusion

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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